THE ASTROPHYSICAL JOURNAL

Founded in 1895 by George E. Hale and James E. Keeler

ETHAN T. VISHNIAC

Editor-in-Chief Johns Hopkins University CHRISTOPHER SNEDEN

Letters Editor University of Texas

W. B. BURTON

Associate Editor University of Leiden & National Radio Astronomy Observatory

JOHN SCALO

Deputy Letters Editor University of Texas

Scientific Editors

TIMOTHY BASTIAN

National Radio Astronomy Observatory

JOHN BLACK

Onsala Space Observatory

BRIAN CHABOYER RICHARD DE GRIJS ERIC D. FEIGELSON KATIA FERRIERE

Dartmouth College

The University of Sheffield

Pennsylvania State University

Observatoire Midi-Pyrenees

BRAD GIBSON University of Central Lancashire

LEON GOLUB

Smithsonian Astrophysical Observatory

DIETER HARTMANN

Clemson University

STEVEN KAWALER Iowa State University

ARI LAOR Israel Institute of Technology

CHUNG-PEI MA University of California Berkeley

JUDITH PIPHER

University of Rochester

SUSAN M. SIMKIN

Michigan State University

LUIGI STELLA Osservatorio Astronomico

di Roma

AAS PUBLICATIONS BOARD

MICHAEL A'HEARN (2005-2008), Chairperson University of Maryland

PATRICK J. MCCARTHY (2006-2009)

The Carnegie Observatories

JOSEPH CASSINELLI (2004-2007) University of Wisconsin

BO REIPURTH (2006-2009) University of Hawaii

RICHARD GREEN (2004-2007) NOAO

VIRGINIA L. TRIMBLE (2005-2008) University of California, Irvine

LEE ANNE WILLSON (2007-2010) Iowa State University

Operations Manager: MARY GUILLEMETTE Production Manager: ALAIN PARK

Chief Manuscript Editor: ELIZABETH HUYCK

Manuscript Editors: Thad A. Doria, Greg Hajek, Paul Ruich, Don Reneau, Eric Shutt, Ellen Credille, JEREMY HORSEFIELD, KERRY TUPPER, ALISON COMPTON, ERICA GRIFFIN, ERIK GREGERSEN, ELIZABETH SCHAEFER, JENNIFER DAVIS, BRENDAN CARRICK, ISAAC ROBINOVITZ, CAROLYN STEELE, JOSHUA ALLEN, NATHAN CZUBA, ROBIN TAYLOR, AND ANTHONY STRIMPLE Production Staff: CINDY GARRETT, LAURA STALEY, ERIK CAMERON, KELLY WILLIAMS, ABBY DENNIS, AMBIKA SESHADRI, AND CHRIS WIBERG

Baltimore Editorial Office: JANICE SEXTON

VOLUME 660, PART 1

2007 MAY 1 AND MAY 10

PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS FOR THE AMERICAN ASTRONOMICAL SOCIETY

 $\ \, \odot$ 2007 by American astronomical society. All rights reserved. Published three times a month

COMPOSED BY SPI PUBLISHER SERVICES
PRINTED BY THE SHERIDAN PRESS
HANOVER, PENNSYLVANIA, U.S.A.

THE ASTROPHYSICAL JOURNAL CONTENTS OF VOLUME 660, PART 1

2007 MAY 1, NUMBER 1

	Pa	age
GRAVITATIONAL LENS TIME DELAYS: A STATISTICAL ASSESSMENT OF LENS MODEL DEPENDENCES AND IMPLICATIONS FOR THE GLOBAL HUBBLE CONSTANT $@$ Masamune $Oguri$		1
THE HUBBLE DIAGRAM TO REDSHIFT >6 FROM 69 GAMMA-RAY BURSTS Bradley E. Schaefer		16
SPECTROSCOPY OF $z\sim 6$ i-DROPOUT GALAXIES: FREQUENCY OF Ly α EMISSION AND THE SIZES OF Ly α -EMITTING GALAXIES C. C. Dow-Hygelund, B. P. Holden, R. J. Bouwens, G. D. Illingworth, A. van der Wel, M. Franx, P. G. van Dokkum, H. For P. Rosati, D. Magee, & A. Zirm		47
THE DEEP2 GALAXY REDSHIFT SURVEY: REDSHIFT IDENTIFICATION OF SINGLE-LINE EMISSION GALAXIES Evan N. Kirby, Puragra Guhathakurta, S. M. Faber, David C. Koo, Benjamin J. Weiner, & Michael C. Cooper	(E)	62
LUMINOSITY-DEPENDENT CLUSTERING OF STAR-FORMING BzK GALAXIES AT REDSHIFT 2 Masao Hayashi, Kazuhiro Shimasaku, Kentaro Motohara, Makiko Yoshida, Sadanori Okamura, & Nobunari Kashikawa		72
RADIUS-DEPENDENT LUMINOSITY EVOLUTION OF BLUE GALAXIES IN GOODS-N © J. Melbourne, A. C. Phillips, J. Harker, G. Novak, D. C. Koo, & S. M. Faber		81
THE INFRARED LUMINOSITY FUNCTION OF GALAXIES AT REDSHIFTS $z=1$ AND $z\sim2$ IN THE GOODS FIELDS K. I. Caputi, G. Lagache, Lin Yan, H. Dole, N. Bavouzet, E. Le Floc'h, P. I. Choi, G. Helou, & N. Reddy	©	97
SPITZER OBSERVATIONS OF 3C QUASARS AND RADIO GALAXIES: MID-INFRARED PROPERTIES OF POWERFUL RADIO SOURCES K. Cleary, C. R. Lawrence, J. A. Marshall, L. Hao, & D. Meier	1	117
MID-IR OBSERVATIONS AND A REVISED TIME DELAY FOR THE GRAVITATIONAL LENS SYSTEM QUASAR HE 1104—1805 © Shawn Poindexter, Nicholas Morgan, Christopher S. Kochanek, & Emilio E. Falco	1	146
RESULTS OF MONITORING THE DRAMATICALLY VARIABLE C IV MINI-BROAD ABSORPTION LINE SYSTEM IN THE QUASAR HS 1603+3820 © Toru Misawa, Michael Eracleous, Jane C. Charlton, & Nobunari Kashikawa	1	152
SPITZER POWER-LAW ACTIVE GALACTIC NUCLEUS CANDIDATES IN THE CHANDRA DEEP FIELD-NORTH J. L. Donley, G. H. Rieke, P. G. Pérez-González, J. R. Rigby, & A. Alonso-Herrero	D 1	167
SHOCK HEATING IN THE NEARBY RADIO GALAXY NGC 3801 J. H. Croston, R. P. Kraft, & M. J. Hardcastle	1	191
HIGH-FREQUENCY VLBI IMAGING OF THE JET BASE OF M87 © Chun Ly. R. Craig Walker, & William Junor	2	200
PROBING \sim 100 AU INTERGALACTIC Mg II ABSORBING "CLOUDLETS" WITH QUASAR MICROLENSING Subo Dong	2	206
THE IONIZATION STATE OF SODIUM IN GALACTIC WINDS © Norman Murray, Crystal L. Martin, Eliot Quataert, & Todd A. Thompson	2	211
MaxBCG: A RED-SEQUENCE GALAXY CLUSTER FINDER © Benjamin P. Koester, Timothy A. McKay, James Annis, Risa H. Wechsler, August E. Evrard, Eduardo Rozo, Lindsey Bleem, Erin S. Sheldon, & David Johnston	2	221
A MaxBCG CATALOG OF 13,823 GALAXY CLUSTERS FROM THE SLOAN DIGITAL SKY SURVEY B. P. Koester, T. A. McKay, J. Annis, R. H. Wechsler, A. Evrard, L. Bleem, M. Becker, D. Johnston, E. Sheldon, R. Nichol, C. Miller, R. Scranton, N. Bahcall, J. Barentine, H. Brewington, J. Brinkmann, M. Harvanek, S. Kleinman, J. Krzesinski, D. Long, A. Nitta, D. P. Schneider, S. Sneddin, W. Voges, & D. York	2	239
DISSIPATIONLESS COLLAPSES IN MODIFIED NEWTONIAN DYNAMICS Carlo Ninoti: Pasauale Londrillo & Luca Ciotti	2	256

	rage
SELECTION BIAS IN THE M_{\bullet} - σ AND M_{\bullet} - L CORRELATIONS AND ITS CONSEQUENCES \textcircled{a} Mariangela Bernardi, Ravi K. Sheth, Elena Tundo, & Joseph B. Hyde	267
DENSITY STRUCTURE OF THE INTERSTELLAR MEDIUM AND THE STAR FORMATION RATE IN GALACTIC DISKS Keiichi Wada & Colin A. Norman	276
CIRCUMNUCLEAR STAR CLUSTERS IN THE GALAXY MERGER NGC 6240, OBSERVED WITH KECK ADAPTIVE OPTICS AND THE <i>HUBBLE SPACE TELESCOPE L. K. Pollack, C. E. Max, & G. Schneider</i>	288
HV 11423: THE COOLEST SUPERGIANT IN THE SMC Philip Massey, Emily M. Levesque, K. A. G. Olsen, Bertrand Plez, & B. A. Skiff	301
HYPERVELOCITY STARS. II. THE BOUND POPULATION © Warren R. Brown, Margaret J. Geller, Scott J. Kenyon, Michael J. Kurtz, & Benjamin C. Bromley	311
BLUE STRAGGLER STARS IN GALACTIC OPEN CLUSTERS AND THE SIMPLE STELLAR POPULATION MODEL Y. Xin, L. Deng, & Z. W. Han	319
COSMIC RAYS, DUST, AND THE MIXING OF SUPERNOVA EJECTA INTO THE INTERSTELLAR MEDIUM IN SUPERBUBBLES R. E. Lingenfelter & J. C. Higdon	330
ADIABATIC COMPRESSION ACCELERATION OF FAST CHARGED PARTICLES J. R. Jokipii & J. Giacalone	336
MULTIPLE COAXIAL RINGS IN THE BIPOLAR NEBULA HUBBLE 12 Sun Kwok & Chih Hao Hsia	341
A MULTIWAVELENGTH STUDY OF M17: THE SPECTRAL ENERGY DISTRIBUTION AND PAH EMISSION MORPHOLOGY OF A MASSIVE STAR FORMATION REGION Matthew S. Povich, Jennifer M. Stone, Ed Churchwell, Ellen G. Zweibel, Mark G. Wolfire, Brian L. Babler, Rémy Indebetouw, Marilyn R. Meade, & Barbara A. Whitney	346
METHYL FORMATE IN THE NGC 2264 IRS 1 REGION Nami Sakai, Takeshi Sakai, & Satoshi Yamamoto	363
PROTOSTAR FORMATION IN MAGNETIC MOLECULAR CLOUDS BEYOND ION DETACHMENT. I. FORMULATION OF THE PROBLEM AND METHOD OF SOLUTION Konstantinos Tassis & Telemachos Ch. Mouschovias	370
PROTOSTAR FORMATION IN MAGNETIC MOLECULAR CLOUDS BEYOND ION DETACHMENT. II. TYPICAL AXISYMMETRIC SOLUTION Konstantinos Tassis & Telemachos Ch. Mouschovias	388
PROTOSTAR FORMATION IN MAGNETIC MOLECULAR CLOUDS BEYOND ION DETACHMENT. III. A PARAMETER STUDY Konstantinos Tassis & Telemachos Ch. Mouschovias	402
DISCOVERY OF A MOLECULAR OUTFLOW IN THE HARO 6-10 STAR-FORMING REGION Irena Stojimirović, Gopal Narayanan, & Ronald L. Snell	418
COLLIMATION, PROPER MOTIONS, AND PHYSICAL CONDITIONS IN THE HH 30 JET FROM HUBBLE SPACE TELESCOPE SLITLESS SPECTROSCOPY Patrick Hartigan & Jon Morse	426
THE CHEMISTRY OF MULTIPLY DEUTERATED MOLECULES IN PROTOPLANETARY DISKS. I. THE OUTER DISK $K.\ Willacy$	441
NEAR-IR CO OVERTONE EMISSION IN 51 OPHIUCHI M. G. Berthoud, L. D. Keller, T. L. Herter, M. J. Richter, & D. G. Whelan	461
H 21 cm EMISSION AS A TRACER OF GAS DURING THE EVOLUTION FROM PROTOPLANETARY TO DEBRIS DISKS © 1. Kamp, W. Freudling, & Jayaram N. Chengalur	469
MASSIVE STAR FORMATION VIA HIGH ACCRETION RATES AND EARLY DISK-DRIVEN OUTFLOWS © Robi Banerjee & Ralph E. Pudritz	479
THE REMARKABLE AFTERGLOW OF GRB 061007: IMPLICATIONS FOR OPTICAL FLASHES AND GRB FIREBALLS C. G. Mundell, A. Melandri, C. Guidorzi, S. Kobayashi, I. A. Steele, D. Malesani, L. Amati, P. D'Avanzo, D. F. Bersier, A. Gomboc, E. Rol, M. F. Bode, D. Carter, C. J. Mottram, A. Monfardini, R. J. Smith, S. Malhotra, J. Wang, N. Bannister, P. T. O'Brien, & N. R. Tanvir	489
GALAXY CLUSTERS ASSOCIATED WITH SHORT GRBs. I. THE FIELDS OF GRBs 050709, 050724, 050911, AND 051221a	496
THE ERO HOST GALAXY OF GRB 020127: IMPLICATIONS FOR THE METALLICITY OF GRB PROGENITORS E. Berger, D. B. Fox, S. R. Kulkarni, D. A. Frail, & S. G. Djorgovski	504

CONSTRAINING DEFLAGRATION MODELS OF TYPE Ia SUPERNOVAE THROUGH INTERMEDIATE-MASS ELEMENTS	Page 509
D. García-Senz, E. Bravo, R. M. Cabezón, & S. E. Woosley	
SUPERNOVA NUCLEOSYNTHESIS IN POPULATION III 13−50 M _☉ STARS AND ABUNDANCE PATTERNS OF EXTREMELY METAL-POOR STARS Nozomu Tominaga, Hideyuki Umeda, & Ken'ichi Nomoto	516
A NOTE ON THE SLIM ACCRETION DISK MODEL Wei-Min Gu & Ju-Fu Lu	541
INTERACTION OF MASSIVE BLACK HOLE BINARIES WITH THEIR STELLAR ENVIRONMENT. II. LOSS CONE DEPLETION AND BINARY ORBITAL DECAY © Alberto Sesana, Francesco Haardt, & Piero Madau	546
POWER SPECTRA OF BLACK HOLES AND NEUTRON STARS AS A PROBE OF HYDRODYNAMIC STRUCTURE OF THE SOURCE: DIFFUSION THEORY AND ITS APPLICATION TO CYGNUS X-1 AND CYGNUS X-2 X-RAY OBSERVATIONS Lev Titarchuk, Nikolai Shaposhnikov, & Vadim Arefiev	556
QUASI-PERIODIC VARIABILITY IN NGC 5408 X-1 Tod E. Strohmayer, Richard F. Mushotzky, Lisa Winter, Roberto Soria, Phil Uttley, & Mark Cropper	580
VARIABILITY OF 19 MILLISECOND PULSARS IN 47 TUCANAE WITH CHANDRA HRC-S P. B. Cameron, R. E. Rutledge, F. Camilo, L. Bildsten, S. M. Ransom, & S. R. Kulkarni	587
AN ACCRETING MILLISECOND PULSAR WITH BLACK HOLE - LIKE X-RAY VARIABILITY: IGR J00291+5934 Manuel Linares, Michiel van der Klis, & Rudy Wijnands	595
HIGH-RESOLUTION X-RAY SPECTROSCOPY OF THE ULTRACOMPACT LMXB PULSAR 4U 1626–67 Miriam I. Krauss, Norbert S. Schulz, Deepto Chakrabarty, Adrienne M. Juett, & Jean Cottam	605
RESONANT CYCLOTRON SCATTERING IN THREE DIMENSIONS AND THE QUIESCENT NONTHERMAL X-RAY EMISSION OF MAGNETARS Rodrigo Fernández & Christopher Thompson	615
A DUSTY DISK AROUND WD 1150–153: EXPLAINING THE METALS IN WHITE DWARFS BY ACCRETION FROM THE INTERSTELLAR MEDIUM VERSUS DEBRIS DISKS © Mukremin Kilic & Seth Redfield	641
DISCOVERY OF RAPID HARD X-RAY VARIABILITY AND NEW JET ACTIVITY IN THE SYMBIOTIC BINARY R AQUARII J. S. Nichols, J. DePasquale, E. Kellogy, C. S. Anderson, J. Sokoloski, & J. Pedeliv	651
AR URSAE MAJORIS DISCOVERED TO BE A PERSISTENT RADIO POLAR: RESULTS FROM A VLA SURVEY OF MAGNETIC CATACLYSMIC VARIABLES Paul A. Mason & Candace L. Gray	662
η CARINAE ACROSS THE 2003.5 MINIMUM: SPECTROSCOPIC EVIDENCE FOR MASSIVE BINARY INTERACTIONS K. E. Nielsen, M. F. Corcoran, T. R. Gull, D. J. Hillier, K. Hamaguchi, S. Ivarsson, & D. J. Lindler	669
A NOZZLE ANALYSIS OF SLOW-ACCELERATION SOLUTIONS IN ONE-DIMENSIONAL MODELS OF ROTATING HOT-STAR WINDS Thomas 1. Madura, Stanley P. Owocki, & Achim Feldmeier	687
OVERLUMINOUS BLUE HORIZONTAL-BRANCH STARS FORMED BY LOW-MASS COMPANIONS Noam Soker & Amos Harpaz	699
A SIMULTANEOUS OPTICAL AND X-RAY VARIABILITY STUDY OF THE ORION NEBULA CLUSTER. II. A COMMON ORIGIN IN MAGNETIC ACTIVITY © Keivan G. Stassun, M. van den Berg, & Eric Feigelson	704
OXYGEN ABUNDANCE OF OPEN CLUSTER DWARFS ZX. Shen, XW. Liu, HW. Zhang, B. Jones, & D. N. C. Lin	712
BEAT CEPHEIDS AS PROBES OF STELLAR AND GALACTIC METALLICITY © J. Robert Buchler & Róbert Szabó	723
ON THE CORRELATION BETWEEN THE MAGNETIC ACTIVITY LEVELS, METALLICITIES, AND RADII OF LOW-MASS STARS Mercedes López-Morales	732
RUNAWAY MASSIVE BINARIES AND CLUSTER EJECTION SCENARIOS M. Virginia McSwain, Scott M. Ransom, Tabetha S. Boyajian, Erika D. Grundstrom, & Mallory S. E. Roberts	740
SPECTROSCOPIC STUDIES OF EXTREMELY METAL-POOR STARS WITH THE SUBARU HIGH-DISPERSION SPECTROGRAPH. IV. THE α-ELEMENT-ENHANCED METAL-POOR STAR BS 16934-002 [®] Wako Aoki, Satoshi Honda, Timothy C. Beers, Masahide Takada-Hidai, Nobuyuki Iwamoto, Nozomu Tominaga, Hideyuki Umeda, Ken'ichi Nomoto, John E. Norris, & Sean G. Ryan	747
FIRST ON-SKY HIGH-CONTRAST IMAGING WITH AN APODIZING PHASE PLATE Mathew 4 Kenwarthy Johanna I. Codana Philip M. Hint I. Royer P. Angel Ari Heinte & Suresh Siyanandam	762

CONTENTS	Page
A NEW ALGORITHM FOR POINT-SPREAD FUNCTION SUBTRACTION IN HIGH-CONTRAST IMAGING: A DEMONSTRATION WITH ANGULAR DIFFERENTIAL IMAGING David Lafrenière, Christian Marois, René Doyon, Daniel Nadeau, & Étienne Artigau	770
CHARACTERIZATION OF GRAVITATIONAL MICROLENSING PLANETARY HOST STARS David P. Bennett, Jay Anderson, & B. Scott Gaudi	781
TIDAL BARRIER AND THE ASYMPTOTIC MASS OF PROTO – GAS GIANT PLANETS Ian Dobbs-Dixon, Shu Lin Li, & D. N. C. Lin	791
TERRESTRIAL PLANET FORMATION AROUND INDIVIDUAL STARS WITHIN BINARY STAR SYSTEMS Elisa V. Quintana, Fred C. Adams, Jack J. Lissauer, & John E. Chambers	807
FORMATION OF EARTH-LIKE PLANETS DURING AND AFTER GIANT PLANET MIGRATION Avi M. Mandell, Sean N. Raymond, & Steinn Sigurdsson	823
THE SEPARATION/PERIOD GAP IN THE DISTRIBUTION OF EXTRASOLAR PLANETS AROUND STARS WITH MASSES $M \geq 1.2~M_\odot$ Andreas Burkert & Shigeru Ida	845
MILLIMAGNITUDE PHOTOMETRY FOR TRANSITING EXTRASOLAR PLANETARY CANDIDATES. II. TRANSITS OF OGLE-TR-113-b IN THE OPTICAL AND NEAR-IR ® Rodrigo F. Díaz, Sebastián Ramírez, José Miguel Fernández, José Gallardo, Wolfgang Gieren, Valentin D. Ivanov, Pablo Mauas, Dante Minniti, Grzegorz Pietrzynski, Felipe Pérez, María Teresa Ruíz, Andrzej Udalski, & Manuela Zoccali	850
MILLIMAGNITUDE PHOTOMETRY FOR TRANSITING EXTRASOLAR PLANETARY CANDIDATES. III. ACCURATE RADIUS AND PERIOD FOR OGLE-TR-111-b Dante Minniti, José Miguel Fernández, Rodrigo F. Díaz, Andrzej Udalski, Grzegorz Pietrzynski, Wolfgang Gieren, Patricio Rojo, María Teresa Ruíz, & Manuela Zoccali	858
GENERALIZED SQUASHING FACTORS FOR COVARIANT DESCRIPTION OF MAGNETIC CONNECTIVITY IN THE SOLAR CORONA $\it V. S. Titov$	863
THE RADIO-CORONAL MASS EJECTION EVENT ON 2001 APRIL 15 Dalmiro Jorge Filipe Maia, Ricardo Gama, Claude Mercier, Monique Pick, Alain Kerdraon, & Marian Karlický	874
THE SOLAR ECLIPSE OF 2006 AND THE ORIGIN OF RAYLIKE FEATURES IN THE WHITE-LIGHT CORONA YM. Wang, J. B. Biersteker, N. R. Sheeley Jr., S. Koutchmy, J. Mouette, & M. Druckmüller	882
THE RELAXATION OF SHEARED MAGNETIC FIELDS: A CONTRACTING PROCESS Haisheng Ji, Guangli Huang, & Haimin Wang	893
SOLAR WIND HELIUM ABUNDANCE AS A FUNCTION OF SPEED AND HELIOGRAPHIC LATITUDE: VARIATION THROUGH A SOLAR CYCLE Justin C. Kasper, Michael L. Stevens, Alan J. Lazarus, John T. Steinberg, & Keith. W. Oqilvie	901
MECHANISMS OF AMINO ACID FORMATION IN INTERSTELLAR ICE ANALOGS Jamie E. Elsila, Jason P. Dworkin, Max P. Bernstein, Mildred P. Martin, & Scott A. Sandford	911
OSCILLATOR STRENGTHS FOR ULTRAVIOLET TRANSITIONS IN P 11 S. R. Federman, M. Brown, S. Torok, S. Cheng, R. E. Irving, R. M. Schectman, & L. J. Curtis	919
2007 MAY 10, NUMBER 2	
CONSTRAINTS ON REIONIZATION AND SOURCE PROPERTIES FROM THE ABSORPTION SPECTRA OF $z > 6.2$ QUASARS © Andrei Mesinger & Zoltán Haiman	923
THE KINETIC SUNYAEV-ZEL'DOVICH EFFECT FROM RADIATIVE TRANSFER SIMULATIONS OF PATCHY REIONIZATION © Ilian T. Iliev, Ue-Li Pen, J. Richard Bond, Garrelt Mellema, & Paul R. Shapiro	933
DISTRIBUTION OF DAMPED Lyα ABSORBERS IN A Λ COLD DARK MATTER UNIVERSE © Kentaro Nagamine, Arthur M. Wolfe, Lars Hernquist, & Volker Springel	945
CLEANED 3 YEAR WILKINSON MICROWAVE ANISTROPY PROBE COSMIC MICROWAVE BACKGROUND MAP: MAGNITUDE OF THE QUADRUPOLE AND ALIGNMENT OF LARGE-SCALE MODES Chan-Gyung Park, Changbom Park, & J. Richard Gott III	959
IMPLICATIONS OF THE COSMIC BACKGROUND IMAGER POLARIZATION DATA J. L. Sievers, C. Achermann, J. R. Bond, L. Bronfman, R. Bustos, C. R. Contaldi, C. Dickinson, P. G. Ferreira, M. E. Jones, A. M. Lewis, B. S. Mason, J. May, S. T. Myers, N. Oyarce, S. Padin, T. J. Pearson, M. Pospieszalski, A. C. S. Readhead, R. Reeves, A. C. Taylor, & S. Torres	976

CONTENTS Page ON THE CONTRIBUTION OF ACTIVE GALACTIC NUCLEI TO THE COSMIC BACKGROUND RADIATION 988 D. R. Ballantyne & C. Panovich A NEW MEASURE FOR WEAK-LENSING FLEXION 995 Yuki Okura, Keiichi Umetsu, & Toshifumi Futamase MEASURING FLEXION 1003 David M. Goldberg & Adrienne Leonard INTEGRAL FIELD SPECTROSCOPY OF THE QUADRUPLY LENSED QUASAR IRXS J1131-1231: 1016 NEW LIGHT ON LENS SUBSTRUCTURES H. Sugai, A. Kawai, A. Shimono, T. Hattori, G. Kosuqi, N. Kashikawa, K. T. Inoue, & M. Chiba THE AGES AND MASSES OF Ly α GALAXIES AT $z\sim4.5$ 1023 Steven L. Finkelstein, James E. Rhoads, Sangeeta Malhotra, Norbert Pirzkal, & Junxian Wang THE CROSS-CORRELATION OF HIGH-REDSHIFT 21 cm AND GALAXY SURVEYS © 1030 Steven R. Furlanetto & Adam Lidz THE NUCLEAR TO HOST GALAXY RELATION OF HIGH-REDSHIFT QUASARS © 1039 Jari K. Kotilainen, Renato Falomo, Marzia Labita, Aldo Treves, & Michela Uslenghi ON THE FAINT END OF THE HIGH-REDSHIFT ACTIVE GALACTIC NUCLEUS LUMINOSITY FUNCTION 1051 Francesco Shankar & Smita Mathur A MID-INFRARED SPECTROSCOPIC STUDY OF SUBMILLIMETER GALAXIES: 1060 LUMINOUS STARBURSTS AT HIGH REDSHIFT E. Valiante, D. Lutz, E. Sturm, R. Genzel, L. J. Tacconi, M. D. Lehnert, & A. J. Baker THE UNIFIED MODEL OF ACTIVE GALACTIC NUCLEI. II. EVOLUTIONARY CONNECTION © 1072 Jian-Min Wang & En-Peng Zhang A SURVEY OF WEAK Mg II ABSORBERS AT 0.4 < 2 < 2.4 ® 1093 Anand Narayanan, Toru Misawa, Jane C. Charlton, & Tae-Sun Kim SPATIALLY RESOLVED X-RAY SPECTRA OF NGC 4258 Y. Yang, B. Li, A. S. Wilson, & C. S. Reynolds COSMOLOGICAL EFFECTS OF POWERFUL AGN OUTBURSTS IN GALAXY CLUSTERS: 1118 INSIGHTS FROM AN XMM-NEWTON OBSERVATION OF MS 0735+7421 M. Gitti, B. R. McNamara, P. E. J. Nulsen, & M. W. Wise CREATION OF X-RAY CAVITIES IN GALAXY CLUSTERS WITH COSMIC RAYS William G. Mathews & Fabrizio Brighenti GALAXY CLUSTERS ASSOCIATED WITH SHORT GRBs. II. PREDICTIONS FOR THE RATE 1146 OF SHORT GRBs IN FIELD AND CLUSTER EARLY-TYPE GALAXIES M.-S. Shin & E. Berger THE MORPHOLOGICAL CONTENT OF 10 EDisCS CLUSTERS AT 0.5 < z < 0.8 © 1151 V. Desai, J. J. Dalcanton, A. Aragón-Salamanca, P. Jablonka, B. Poggianti, S. M. Gogarten, L. Simard, B. Milvang-Jensen, G. Rudnick, D. Zaritsky, D. Clowe, C. Halliday, R. Pelló, R. Saglia, & S. White SUPERNOVAE IN LOW-REDSHIFT GALAXY CLUSTERS: THE TYPE Ia SUPERNOVA RATE 1165 Keren Sharon, Avishay Gal-Yam, Dan Maoz, Alexei V. Filippenko, & Puragra Guhathakurta A SYSTEMATIC SEARCH FOR HIGH SURFACE BRIGHTNESS GIANT ARCS IN A SLOAN DIGITAL 1176 SKY SURVEY CLUSTER SAMPLE J. Estrada, J. Annis, H. T. Diehl, P. B. Hall, T. Las, H. Lin, M. Makler, K. W. Merritt, V. Scarpine, S. Allam, & D. Tucker VIRGO CLUSTER EARLY-TYPE DWARF GALAXIES WITH THE SLOAN DIGITAL SKY SURVEY. III. 1186 SUBPOPULATIONS: DISTRIBUTIONS, SHAPES, ORIGINS Thorsten Lisker, Eva K. Grebel, Bruno Binggeli, & Katharina Glatt 350 µm OBSERVATIONS OF ULTRALUMINOUS INFRARED GALAXIES AT INTERMEDIATE REDSHIFTS 1198 M. Yang, T. R. Greve, C. D. Dowell, & C. Borys THE REMARKABLE 60 × 2 kpc OPTICAL FILAMENT ASSOCIATED WITH A POSTSTARBURST 1209 GALAXY IN THE COMA CLUSTER Masafumi Yaqi, Yutaka Komiyama, Michitoshi Yoshida, Hisanori Furusawa, Nobunari Kashikawa, Yusei Koyama, & Sadanori Okamura FAR-INFRARED SPITZER OBSERVATIONS OF ELLIPTICAL GALAXIES: EVIDENCE FOR EXTENDED DIFFUSE DUST 1215 Pasquale Temi, Fabrizio Brighenti, & William G. Mathews

GRAVITATIONAL RUNAWAY AND TURBULENCE DRIVING IN STAR-GAS GALACTIC DISKS

THE LOW-MASS X-RAY BINARY AND GLOBULAR CLUSTER CONNECTION IN VIRGO CLUSTER

Gregory R. Sivakoff, Andrés Jordán, Craig L. Sarazin, John P. Blakeslee, Patrick Côté, Laura Ferrarese,

Woong-Tae Kim & Eve C. Ostriker

EARLY-TYPE GALAXIES: OPTICAL PROPERTIES

Adrienne M. Juett. Simona Mei. & Eric W. Peno

vii

1246

THE VIRGO STELLAR OVERDENSITY: MAPPING THE INFALL OF THE SAGITTARIUS TIDAL STREAM ONTO THE MILKY WAY DISK © David Martinez-Delgado, Jorge Peñarrubia, Mario Jurić, Emilio J. Alfaro, & Zeljko Ivezić	1264
THE EFFECTS OF THERMAL CONDUCTION ON RADIATIVELY INEFFICIENT ACCRETION FLOWS Bryan M. Johnson & Eliot Quataert	1273
THE SPITZER IRS INFRARED SPECTRUM AND ABUNDANCES OF THE PLANETARY NEBULA IC 2448 S. Guiles, J. Bernard-Salas, S. R. Pottasch, & T. L. Roellig	1282
THE FORMATION OF ACETIC ACID (CH ₃ COOH) IN INTERSTELLAR ICE ANALOGS Chris J. Bennett & Ralf I. Kaiser	1289
FROM ULTRACOMPACT TO EXTENDED H II REGIONS. II. CLOUD GRAVITY AND STELLAR MOTION José Franco, Guillermo García-Segura, Stanley E. Kurtz, & S. Jane Arthur	1296
USING THE X-RAY DUST SCATTERING HALO OF 4U 1624—490 TO DETERMINE DISTANCE AND DUST DISTRIBUTIONS Jingen Xiang, Julia C. Lee, & Michael A. Nowak	1309
BEHAVIOR OF X-RAY DUST SCATTERING AND IMPLICATIONS FOR X-RAY AFTERGLOWS OF GAMMA-RAY BURSTS © L. Shao & Z. G. Dai	1319
VELOCITY DISTRIBUTION OF COLLAPSING STARLESS CORES, L694-2 AND L1197 Seok Ho Lee, Yong-Sun Park, Jungjoo Sohn, Chang Won Lee, & Hyung Mok Lee	1326
STAR FORMATION AT VERY LOW METALLICITY. II. ON THE INSIGNIFICANCE OF METAL-LINE COOLING DURING THE EARLY STAGES OF GRAVITATIONAL COLLAPSE AK. Jappsen, S. C. O. Glover, R. S. Klessen, & MM. Mac Low	1332
OFF-CENTER IGNITION IN TYPE Ia SUPERNOVAE. I. INITIAL EVOLUTION AND IMPLICATIONS FOR DELAYED DETONATION F. K. Röpke, S. E. Woosley, & W. Hillebrandt	1344
BIRTH KICK DISTRIBUTIONS AND THE SPIN-KICK CORRELATION OF YOUNG PULSARS CY. Ng & Roger W. Romani	1357
MAGNETOHYDRODYNAMIC SHEARING WAVES Bryan M. Johnson	1375
X-RAY SPECTRAL VARIABILITY IN THE INITIAL RISE OF XTE J1550–564 YX. Wu, CZ. Liu, & TP. Li	1386
X-RAY VARIABILITY COHERENCE IN THE TIME DOMAIN Xiao Che, Cong-Zhan Liu, & Ti-Pei Li	1393
JOINT Hα AND X-RAY OBSERVATIONS OF MASSIVE X-RAY BINARIES. III. THE BE X-RAY BINARIES HDE 245770 = A0535+26 AND X PERSEI ⑤ E. D. Grundstrom, T. S. Boyajian, C. Finch, D. R. Gies, W. Huang, M. V. McSwain, D. P. O'Brien, R. L. Riddle, M. L. Trippe, S. J. Williams, D. W. Wingert, & R. A. Zaballa	1398
QUASI-PERIODIC OSCILLATIONS IN XTE J0111.2—7317: HIGHEST FREQUENCY AMONG THE HMXB PULSARS Ramanpreet Kaur, Biswajit Paul, Harsha Raichur, & Ram Sagar	1409
X-RAY EMISSION FROM PSR B1800–21, ITS WIND NEBULA, AND SIMILAR SYSTEMS O. Kargaltsev, G. G. Pavlov, & G. P. Garmire	1413
CONSTRAINTS ON THERMAL X-RAY RADIATION FROM SAX J1808.4—3658 AND IMPLICATIONS FOR NEUTRON STAR NEUTRINO EMISSION C. O. Heinke, P. G. Jonker, R. Wijnands, & R. E. Taam	1424
THE DISTANCE TO THE ISOLATED NEUTRON STAR RX J0720.4–3125 © D. L. Kaplan, M. H. van Kerkwijk, & J. Anderson	1428
THERMALLY STABLE NUCLEAR BURNING ON ACCRETING WHITE DWARFS Ken J. Shen & Lars Bildsten	1444
THE LOWEST MASS WHITE DWARF © Mukremin Kilic, Carlos Allende Prieto, Warren R. Brown, & D. Koester	1451
CORONAL ABUNDANCES IN ORION NEBULA CLUSTER STARS © A. Maggio, E. Flaccomio, F. Favata, G. Micela, S. Sciortino, E. D. Feigelson, & K. V. Getman	1462
PISMIS 24-1: THE STELLAR UPPER MASS LIMIT PRESERVED J. Maiz Apellániz, Nolan R. Walborn, N. I. Morrell, V. S. Niemela, & E. P. Nelan	1480
LONG SECONDARY PERIODS AND BINARITY IN RED GIANT STARS © 1. Soszyński	1486

TS Page

1690

1700

1707

THE WIDE BROWN DWARF BINARY OPH 1622-2405 AND DISCOVERY OF A WIDE, LOW-MASS BINARY 1492 IN OPHIUCHUS (OPH 1623-2402): A NEW CLASS OF YOUNG EVAPORATING WIDE BINARIES? Laird M. Close, B. Zuckerman, Inseok Song, Travis Barman, Christian Marois, Emily L. Rice, Nick Siegler, Bruce Macintosh, E. E. Becklin, Randy Campbell, James E. Lyke, Al Conrad, & David Le Mignant THE LATE-T DWARF COMPANION TO THE EXOPLANET HOST STAR HD 3651: A NEW BENCHMARK 1507 FOR GRAVITY AND METALLICITY EFFECTS IN ULTRACOOL SPECTRA © Michael C. Liu, S. K. Leggett, & Kuenley Chiu EVOLUTION OF BROWN DWARF DISKS: A SPITZER SURVEY IN UPPER SCORPIUS 1517 Alexander Scholz, Ray Jayawardhana, Kenneth Wood, Gwendolyn Meeus, Beate Stelzer, Christina Walker, & Mark O'Sullivan SPITZER/IRAC-MIPS SURVEY OF NGC 2244: PROTOSTELLAR DISK SURVIVAL IN THE VICINITY OF HOT STARS © 1532 Zoltan Balog, James Muzerolle, G. H. Rieke, Kate Y. L. Su, Eric T. Young, & S. Tom Megeath COLLISIONAL VAPORIZATION OF DUST AND PRODUCTION OF GAS IN THE β PICTORIS DUST DISK 1541 A. Czechowski & I. Mann CHARACTERIZATION OF DUSTY DEBRIS DISKS: THE IRAS AND HIPPARCOS CATALOGS © 1556 Joseph H. Rhee, Inseok Song, B. Zuckerman, & Michael McElwain WARM HCN, C2H2, AND CO IN THE DISK OF GV TAU 1572 E. L. Gibb, K. A. Van Brunt, S. D. Brittain, & T. W. Rettig ICE FORMATION IN RADIATED ACCRETION DISKS 1580 Sanford S. Davis MECHANISTICAL STUDIES ON THE IRRADIATION OF METHANOL IN EXTRATERRESTRIAL ICES 1588 Chris J. Bennett, Shih-Hua Chen, Bing-Jian Sun, Agnes H. H. Chang, & Ralf I. Kaiser SAVING PLANETARY SYSTEMS: DEAD ZONES AND PLANETARY MIGRATION © 1609 Soko Matsumura, Ralph E. Pudritz, & Edward W. Thommes EQUIPOTENTIAL SURFACES AND LAGRANGIAN POINTS IN NONSYNCHRONOUS, ECCENTRIC BINARY 1624 AND PLANETARY SYSTEMS J. F. Sepinsky, B. Willems, & V. Kalogera NEW PLANETS AROUND THREE G DWARFS 1636 Simon J. O'Toole, R. Paul Butler, C. G. Tinney, Hugh R. A. Jones, Geoffrey W. Marcy, Brad Carter, Chris McCarthy, Jeremy Bailey, Alan J. Penny, Kevin Apps, & Debra Fischer ION CHARGE STATES IN THE FAST SOLAR WIND: NEW DATA ANALYSIS AND THEORETICAL REFINEMENTS 1642 J. Martin Laming & Susan T. Lepri THE POSTERUPTIVE EVOLUTION OF A CORONAL DIMMING (© 1653 Scott W. McIntosh, Robert J. Leamon, Alisdair R. Davey, & Meredith J. Wills-Davey BROADENING OF RESONANTLY SCATTERED ULTRAVIOLET EMISSION LINES BY CORONAL HOLE OUTFLOWS 1660 Nakagawa Akinari DIAGNOSTICS OF SUPRATHERMAL ELECTRONS IN ACTIVE-REGION PLASMAS USING He-LIKE UV LINES 1674 U. Feldman, E. Landi, & G. A. Doschek MAXIMUM ENERGIES OF FORCE-FREE CORONAL FLUX ROPES 1683 Richard Wolfson, Jonathan Larson, & Roberto Lionello

THE INTRINSIC DIMENSIONALITY OF SPECTROPOLARIMETRIC DATA

OF SHORT-LIVED RADIOISOTOPES AND STABLE OXYGEN ISOTOPES

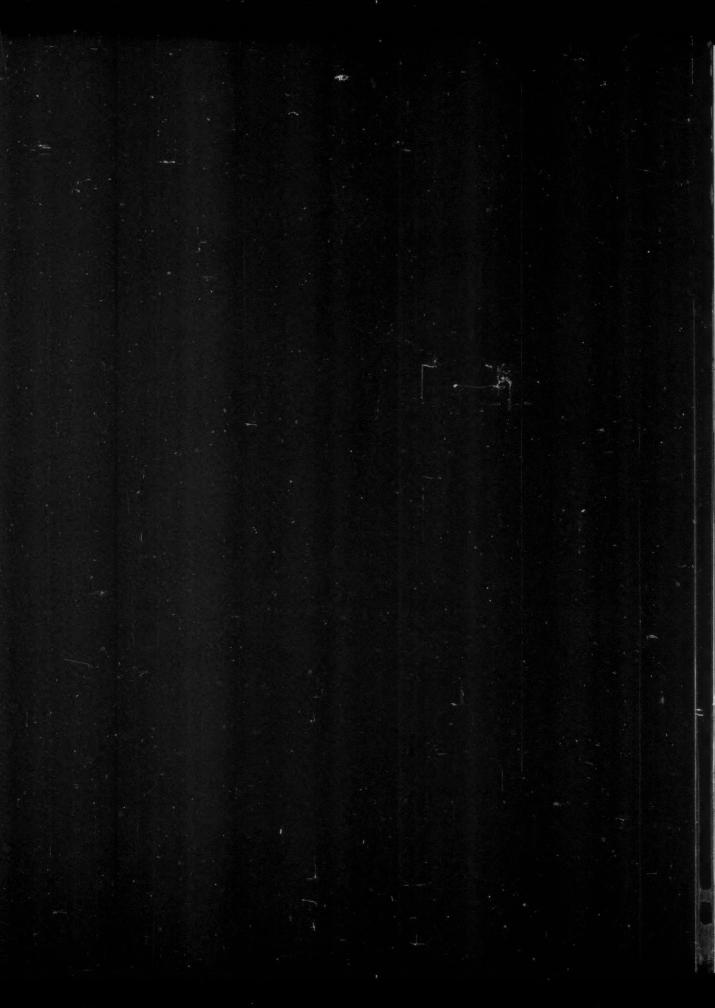
David A. Minton & Renu Malhotra

Alan P. Boss

A. Asensio Ramos, H. Socas-Navarro, A. López Ariste, & M. J. Martinez González

EVOLUTION OF THE SOLAR NEBULA. VIII. SPATIAL AND TEMPORAL HETEROGENEITY

ASSESSING THE MASSIVE YOUNG SUN HYPOTHESIS TO SOLVE THE WARM YOUNG EARTH PUZZLE



THE

ASTROPHYSICAL JOURNAL

Founded in 1895 by George E. Hale and James E. Keeler

ETHAN T. VISHNIAC

Editor-in-Chief

Johns Hopkins University

CHRISTOPHER SNEDEN

Letters Editor

University of Texas

W. B. BURTON
Associate Editor
University of Leiden
and
National Radio Astronomy University

JAMES W. LIEBERT Associate Editor Steward Observatory University of Arizona JOHN SCALO Deputy Letters Editor University of Texas

CRAIG HOGAN Associate Letters Editor University of Washington PETRUS C. MARTENS Associate Letters Editor Montana State University FULVIO MELIA Associate Letters Editor University of Arizona ANNEILA I. SARGENT

Associate Letters Editor

California Institute of Technology

ELLEN ZWEIBEL Associate Letters Editor University of Wisconsin

AAS PUBLICATIONS BOARD

MICHAEL A'HEARN (2005–2008), Chairperson University of Maryland

LEE ANNE WILLSON (2007–2010) Iowa State University

VIRGINIA L. TRIMBLE (2005–2008) University of California, Irvine PATRICK J. McCARTHY (2006–2009) The Carnegie Observatories

JOSEPH CASSINELLI (2004–2007) University of Wisconsin BO REIPURTH (2006–2009) University of Hawai'i

RICHARD GREEN (2004–2007) National Optical Astronomy Observatory

Operations Manager: MARY GUILLEMETTE

Chief Manuscript Editor: ELIZABETH HUYCK

Manuscript Editors: Thad A. Doria, Greg Hajek, Paul Ruich, Don Reneau, Eric Shutt, Jeremy Horsefield, Kerry Tupper, Ellen Credille, Alison Compton, Erica Griffin, Erik Gregersen, Elizabeth Schaefer, Jennifer Davis, Brendan Carrick, Isaac Robinovitz, Carolyn Steele, Joshua Allen, Nathan Czuba, Robin Taylor, and Tony Strimple

Production Staff: CINDY GARRETT, LAURA STALEY, ERIK CAMERON, KELLY WILLIAMS,

ABBY DENNIS, AMBIKA SESHADRI, AND CHRIS WIBERG

Austin Editorial Office: ELIZABETH M. KORVES AND ERIK BRUGAMYER

VOLUME 660, PART 2 2007 MAY 1 AND MAY 10 $\ensuremath{\mathbb{C}}$ 2007 BY THE AMERICAN ASTRONOMICAL SOCIETY. ALL RIGHTS RESERVED. PUBLISHED THREE TIMES A MONTH

COMPOSED BY THE UNIVERSITY OF CHICAGO PRESS, CHICAGO, ILLINOIS, U.S.A. $PRINTED \ BY \ THE \ SHERIDAN \ PRESS$ $HANOVER, \ PENNSYLVANIA, \ U.S.A.$

THE ASTROPHYSICAL JOURNAL LETTERS

CONTENTS OF VOLUME 660, PART 2

2007 MAY 1, NUMBER 1

THE ALL-WAVELENGTH EXTENDED GROTH STRIP INTERNATIONAL SURVEY (AEGIS) DATA SETS M. Davis, P. Guhathakurta, N. P. Konidaris, J. A. Newman, M. L. N. Ashby, A. D. Biggs, P. Barmby, K. Bundy, S. C. Chapman, A. L. Coil, C. J. Conselice, M. C. Cooper, D. J. Croton, P. R. M. Eisenhardt, R. S. Ellis, S. M. Faber, T. Fang, G. G. Fazio, A. Georgakakis, B. F. Gerke, W. M. Goss, S. Gwyn, J. Harker, A. M. Hopkins, JS. Huang, R. J. Ivison, S. A. Kassin, E. N. Kirby, A. M. Koekemoer, D. C. Koo, E. S. Laird, E. Le Floc'h, L. Lin, J. M. Lotz, P. J. Marshall, D. C. Martin, A. J. Metevier, L. A. Moustakas, K. Nandra, K. G. Noeske, C. Papovich, A. C. Phillips, R. M. Rich, G. H. Rieke, D. Rigopoulou, S. Salim, D. Schiminovich, L. Simard, I. Smail, T. A. Small, B. J. Weiner, C. N. A. Willmer, S. P. Willner, G. Wilson, E. L. Wright, and R. Yan	Li
AEGIS: GALAXY SPECTRAL ENERGY DISTRIBUTIONS FROM THE X-RAY TO RADIO N. P. Konidaris, P. Guhathakurta, K. Bundy, A. L. Coil, C. J. Conselice, M. C. Cooper, P. R. M. Eisenhardt, JS. Huang, R. J. Ivison, S. A. Kassin, E. N. Kirby, J. M. Lotz, J. A. Newman, K. G. Noeske, R. M. Rich, T. A. Small, C. N. A. Willmer, and S. P. Willner	L7
AEGIS: THE COLOR-MAGNITUDE RELATION FOR X-RAY-SELECTED ACTIVE GALACTIC NUCLEI (E) K. Nandra, A. Georgakakis, C. N. A. Willmer, M. C. Cooper, D. J. Croton, M. Davis, S. M. Faber, D. C. Koo, E. S. Laird, and J. A. Newman	L11
AEGIS: THE ENVIRONMENT OF X-RAY SOURCES AT $z \approx 1$ (E) A. Georgakakis, K. Nandra, E. S. Laird, M. C. Cooper, B. F. Gerke, J. A. Newman, D. J. Croton, M. Davis, S. M. Faber, and A. L. Coil	L15
AEGIS: HOST GALAXY MORPHOLOGIES OF X-RAY-SELECTED AND INFRARED-SELECTED ACTIVE GALACTIC NUCLEI	L19
AT 0.2 ≤ z < 1.2 C. M. Pierce, J. M. Lotz, E. S. Laird, L. Lin, K. Nandra, J. R. Primack, S. M. Faber, P. Barmby, S. Q. Park, S. P. Willner, S. Gwyn, D. C. Koo, A. L. Coil, M. C. Cooper, A. Georgakakis, A. M. Koekemoer, K. G. Noeske, B. J. Weiner, and C. N. A. Willmer	
THE DEEP2 GALAXY REDSHIFT SURVEY: AEGIS OBSERVATIONS OF A DUAL AGN AT $z=0.7$ © Brian F. Gerke, Jeffrey A. Newman, Jennifer Lotz, Renbin Yan, P. Barmby, Alison L. Coil, Christopher J. Conselice, R. J. Ivison, Lihwai Lin, David C. Koo, Kirpal Nandra, Samir Salim, Todd Small, Benjamin J. Weiner, Michael C. Cooper, Marc Davis, S. M. Faber, and Puragra Guhathakurta	L23
AEGIS: CHANDRA OBSERVATION OF DEEP2 GALAXY GROUPS AND CLUSTERS (E) Taotao Fang, Brian F. Gerke, David S. Davis, Jeffrey A. Newman, Marc Davis, Kirpal Nandra, Elise S. Laird, David C. Koo, Alison L. Coil, Michael C. Cooper, Darren J. Croton, and Renbin Yan	L27
A STRONG-LENS SURVEY IN AEGIS: THE INFLUENCE OF LARGE-SCALE STRUCTURE Leonidas A. Moustakas, Phil Marshall, Jeffrey A. Newman, Alison L. Coil, Michael C. Cooper, Marc Davis, Christopher D. Fassnacht, Puragra Guhathakurta, Andrew Hopkins, Anton Koekemoer, Nicholas P. Konidaris, Jennifer M. Lotz, and Christopher N. A. Willmer	L31
THE STELLAR MASS TULLY-FISHER RELATION TO z = 1.2 FROM AEGIS Susan A. Kassin, Benjamin J. Weiner, S. M. Faber, David C. Koo, Jennifer M. Lotz, Jürg Diemand, Justin J. Harker, Kevin Bundy, A. J. Metevier, Andrew C. Phillips, Michael C. Cooper, Darren J. Croton, Nicholas Konidaris, Kai G. Noeske, and C. N. A. Willmer	L35
AEGIS: EXTINCTION AND STAR FORMATION TRACERS FROM LINE EMISSION © Benjamin J. Weiner, Casey Papovich, K. Bundy, C. J. Conselice, M. C. Cooper, R. S. Ellis, R. J. Ivison, K. G. Noeske, A. C. Phillips, and Renbin Yan	L39
STAR FORMATION IN AEGIS FIELD GALAXIES SINCE $z=1.1$: THE DOMINANCE OF GRADUALLY DECLINING STAR FORMATION, AND THE MAIN SEQUENCE OF STAR-FORMING GALAXIES K. G. Noeske, B. J. Weiner, S. M. Faber, C. Papovich, D. C. Koo, R. S. Somerville, K. Bundy, C. J. Conselice, J. A. Newman, D. Schiminovich, E. Le Floc'h, A. L. Coil, G. H. Rieke, J. M. Lotz, J. R. Primack, P. Barmby, M. C. Cooper, M. Davis, R. S. Ellis, G. G. Fazio, P. Guhathakurta, J. Huang, S. A. Kassin, D. C. Martin, A. C. Phillips, R. M. Rich, T. A. Small, C. N. A. Willner, and G. Wilson	L43
STAR FORMATION IN AEGIS FIELD GALAXIES SINCE $z=1.1$: STAGED GALAXY FORMATION AND A MODEL OF MASS-DEPENDENT GAS EXHAUSTION K. G. Noeske, S. M. Faber, B. J. Weiner, D. C. Koo, J. R. Primack, A. Dekel, C. Papovich, C. J. Conselice, E. Le Floc'h, G. H. Rieke, A. L. Coil, J. M. Lotz, R. S. Somerville, and K. Bundy	L47
AEGIS: ENHANCEMENT OF DUST-ENSHROUDED STAR FORMATION IN CLOSE GALAXY PAIRS AND MERGING GALAXIES UP TO z ~ 1 Lihwai Lin, David C. Koo, Benjamin J. Weiner, Tzihong Chiueh, Alison L. Coil, Jennifer Lotz, Christopher J. Conselice, S. P. Willner, H. A. Smith, Puragra Guhathakurta, JS. Huang, Emeric Le Floc'h, Kai G. Noeske, Christopher N. A. Willmer, Michael C. Cooper, and Andrew C. Phillips	L51
AEGIS: THE DIVERSITY OF BRIGHT NEAR-IR-SELECTED DISTANT RED GALAXIES © C. J. Conselice, J. A. Newman, A. Georgakakis, O. Almaini, A. L. Coil, M. C. Cooper, P. Eisenhardt, S. Foucaud, A. Koekemoer, J. Lotz, K. Noeske, B. Weiner, and C. N. A Willmer	L55
AEGIS: A PANCHROMATIC STUDY OF IRAC-SELECTED EXTREMELY RED OBJECTS WITH CONFIRMED SPECTROSCOPIC REDSHIFTS G. Wilson, JS. Huang, G. G. Fazio, R. Yan, A. M. Koekemoer, S. Salim, S. M. Faber, J. Lotz, C. N. A. Willmer, M. Davis, A. L. Coil, J. A. Newman, C. J. Conselice, C. Papovich, M. L. N. Ashby, P. Barmby, S. P. Willner, R. Ivison, S. Miyazaki, and D. Rigopoulou	L59

GALAXY ORIENTATIONS IN THE COMA CLUSTER

CONTENTS

FAR-INFRARED CHARACTERIZATION OF AN ULTRALUMINOUS STARBURST ASSOCIATED WITH A MASSIVELY ACCRETING BLACK L65 HOLE AT z = 1.15 (E)
E. Le Floc'h, C. N. A. Willmer, K. Noeske, N. P. Konidaris, E. S. Laird, D. C. Koo, K. Nandra, K. Bundy, S. Salim, R. Maiolino, C. J. Conselice, J. M. Lotz, C. Papovich, J. D. Smith, L. Bai, A. L. Coil, P. Barmby, M. L. N. Ashby, J.-S. Huang, M. Blaylock, G. Rieke, J. A. Newman, R. Ivison, S. Chapman, H. Dole, E. Egami, and D. Elbaz AEGIS: INFRARED SPECTROSCOPY OF AN INFRARED-LUMINOUS LYMAN BREAK GALAXY AT z = 3.01 L69 J.-S. Huang, D. Rigopoulou, C. Papovich, M. L. N. Ashby, S. P. Willner, R. Ivison, E. S. Laird, T. Webb, G. Wilson, P. Barmby, S. Chapman, C. Conselice, B. McLeod, C. G. Shu, H. A. Smith, E. Le Floc'h, E. Egami, C. A. N. Willmer, and G. G. Fazio AEGIS: INFRARED SPECTRAL ENERGY DISTRIBUTIONS OF MIPS 70 μm-SELECTED SOURCES 1.73 M. Symeonidis, D. Rigopoulou, J.-S. Huang, M. Davis, M. L. N. Ashby, P. Barmby, E. Egami, G. G. Fazio, E. Le Floc'h, G. Rieke, S. P. Willner, and G. Wilson AEGIS20: A RADIO SURVEY OF THE EXTENDED GROTH STRIP (E) L77 R. J. Ivison, S. C. Chapman, S. M. Faber, Ian Smail, A. D. Biggs, C. J. Conselice, G. Wilson, S. Salim, J.-S. Huang, and S. P. Willner INSTRUCTIONS TO AUTHORS OF LETTERS, AND ADDITIONAL USEFUL INFORMATION Inside Back Cover INSTRUCTIONS FOR ELECTRONIC MANUSCRIPT SUBMISSION Back Cover 2007 MAY 10, NUMBER 2 Page HEMISPHERICAL POWER ASYMMETRY IN THE THIRD-YEAR WILKINSON MICROWAVE ANISOTROPY PROBE SKY MAPS L81 H. K. Eriksen, A. J. Banday, K. M. Górski, F. K. Hansen, and P. B. Lilje OXYGEN PUMPING: PROBING INTERGALACTIC METALS AT THE EPOCH OF REIONIZATION L85 Carlos Hernández-Monteagudo, Zoltán Haiman, Raul Jimenez, and Licia Verde THE GLOBAL SUNYAEV-ZEL'DOVICH EFFECT OF THE CLUSTER POPULATION AND ITS DETECTABILITY IN COSMIC MICROWAVE L89 BACKGROUND MAPS

B. Ascaso and M. Moles HCN OBSERVATIONS OF DENSE STAR-FORMING GAS IN HIGH-REDSHIFT GALAXIES 1.93 Yu Gao, Chris L. Carilli, Philip M. Solomon, and Paul A. Vanden Bout

List forma, Notice De Frogris, and Menter 5. Hest	
VERY DIFFERENT X-RAY-TO-OPTICAL COLUMN DENSITY RATIOS IN γ -RAY BURST AFTERGLOWS: IONIZATION IN GRB ENVIRONMENTS (©)	L101
D. Watson, J. Hiorth, J. P. U. Fynbo, P. Jakobsson, S. Foley, J. Sollerman, and R. A. M. J. Wijers	

L97

The state of the s	
MULTIOBJECT SPECTROSCOPY OF YOUNG STAR CLUSTERS IN NGC 4676	L105
Li-Hsin Chien, Joshua E. Barnes, Lisa J. Kewley, and Kenneth C. Chambers	

BIMODAL INFRARED COLORS OF THE M87 GLOBULAR CLUSTER SYSTEM: PEAKS IN THE METALLICITY DISTRIBUTION	(E)	L109
Arunav Kundu and Stephen E. Zepf		

SPECTRAL EVOLUTION OF NGC 1313 X-2: EVIDENCE AGAINST THE COOL DISK MODEL	L113
Hua Feng and Philip Kaaret	

DISCOVERY OF HE 1523-0901, A STRONGLY r-PROCESS-ENHANCED METAL-POOR STAR WITH DETECTED URANIUM	L117
Anna Frebel, Norbert Christlieb, John E. Norris, Christopher Thom, Timothy C. Beers, and Jaehyon Rhee	

A FAINT, STEEP-SPECTRUM BURST FROM THE RADIO TRANSIENT GCRT J1745-3009	L121
Court D. Houses, Calaboratio Box, Calaboratio Box, Calaboratio Box, I. D. J. T. Lovel, W. L. viv. Box, I. C. Box, Marcia F. V. viv. and C. Blanco	

NONTHERMAL CONTINUUM TOWARD SAGITTARIUS B2(N-LMH)	L12
J. M. Hollis, P. R. Jewell, Anthony J. Remijan, and F. J. Lovas	

VORTICES IN THE WAKES OF ASYMPTOTIC GIANT BRANCH STARS	L129
C. I. Warring Albert A. Ziiletre, and T. I. O'Paine	

ARCSECOND-SCALE KINEMATIC AND CHEMICAL COMPLEXITY IN CEPHEUS A EAST	L13
C. L. Brogan, C. J. Chandler, T. R. Hunter, Y. L. Shirley, and A. P. Sarma	

LABORATORY SIMULATION OF 11-15 µm SPECTRA ASSOCIATED WITH POLYCYCLIC AROMATIC HYDROCARBON MOLECULES	L137
Anning Hu and W. W. Duley	

A CLUMPING-INDEPENDENT DIAGNOSTIC OF STELLAR MASS-LOSS RATES: RAPID CLUMP DESTRUCTION IN ADIA-ATIC COLLIDING WINDS J. M. Pittard	L141
EVIDENCE FOR A PLANETARY COMPANION AROUND A NEARBY YOUNG STAR J. Setiawan, P. Weise, Th. Henning, R. Launhardt, A. Müller, and J. Rodmann	L145
PLANETS FORMED IN HABITABLE ZONES OF M DWARF STARS PROBABLY ARE DEFICIENT IN VOLATILES $Jack\ J.\ Lissauer$	L149
THE SOLAR OXYGEN CRISIS: PROBABLY NOT THE LAST WORD H. Socas-Navarro and A. A. Norton	L153
CORONAL HEAT: SOLAR LOOP TEMPERATURES FROM TRACE TRIPLE-FILTER DATA J. T. Schmelz, V. L. Kashyap, and M. A. Weber	L157
A CHANGING SOLAR SHAPE M. Emilio, R. I. Bush, J. Kuhn, and P. Scherrer	L161
ON THE MOAT-PENUMBRA RELATION S. Vargas Domínguez, J. A. Bonet, V. Martínez Pillet, Y. Katsukawa, Y. Kitakoshi, and L. Rouppe van der Voort	L165
MAGNETOACOUSTIC SHOCKS AS A DRIVER OF QUIET-SUN MOTTLES L. H. M. Rouppe van der Voort, B. De Pontieu, V. H. Hansteen, M. Carlsson, and M. van Noort	L169
ERRATUM: "ENHANCEMENT AND SUPPRESSION OF HEAT TRANSFER BY MHD TURBULENCE" (ApJ, 645, L25 [2006]) A. Lazarian	L173
ERRATUM: "THE INTERNAL ENERGY FOR MOLECULAR HYDROGEN IN GRAVITATIONALLY UNSTABLE PROTOPLANETARY DISKS" (ApJ, 656, L89 [2007]) Aaron C. Boley, Thomas W. Hartquist, Richard H. Durisen, and Scott Michael	L175
INSTRUCTIONS TO AUTHORS OF LETTERS, AND ADDITIONAL INSERTIL INFORMATION	Incida Bask Cons

Back Cover

INSTRUCTIONS FOR ELECTRONIC MANUSCRIPT SUBMISSION